Head and Spinal Cord Injuries

Definition: Head injuries include all fatalities and nonfatal hospitalizations with a discharge diagnosis code of 800.0-801.9, 803.0-804.9, or 850.0-854.1, in any diagnosis field. Spinal cord injuries include all fatalities and nonfatal hospitalizations with a discharge diagnosis code of 806 or 952 , in any diagnosis field.

Summary

In 1994, 3,857 Washington residents were killed or hospitalized due to head and spinal cord injuries (age-adjusted rate: 70.3 per 100,000; crude rate: 72.3 per 100,000). Leading causes of head and spinal cord injuries include motor vehicle collisions and falls. The use of seat belts or protective head gear greatly reduces the risk of head or spinal cord injury in a collision.

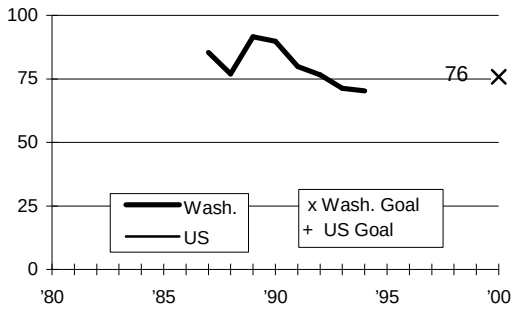
Time Trends

Combined counts of fatal and nonfatal head and spinal cord injuries in Washington are available from 1987 through 1994. During this time there was a significant downward trend in the incidence of head and spinal cord injuries, from a rate of 85.4 per 100,000 in 1987 to 70.3 in 1994. The greatest decline occurred in the 15-24 year age group.

The vast majority of head and spinal cord injuries occur as a result of motor vehicle crashes. It is likely that the decrease in head and spinal cord injuries reflects our state's progress in reducing motor vehicle-related injuries. Much of the success in this area is attributable to increased use of occupant protection devices, reductions in drunk driving, and use of protective head gear by motorcyclists.[1]

Head and Spinal Cord Injuries

Deaths and Non-fatal Hospitalizations per 100,000 Persons
(Age-Adjusted)



Year 2000 Goal

Washington's goal for the year 2000 is an age-adjusted head and spinal cord injury rate of 75.8 per 100,000 (see Technical Notes at end of this section). We met this goal in 1993 and further reduced the rate in 1994.

National estimates of the incidence of head and spinal cord injuries vary. Compared to the nation, Washington appears to have a low head injury rate and an average rate of spinal cord injuries. Precise comparisons are difficult, if not impossible, due to variability in definitions and methods of identifying injuries.

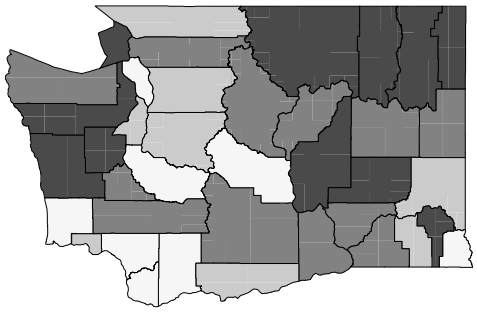
Healthy People 2000 includes a national goal for head and spinal cord injury, but since it does not include fatalities and relies on a case definition not in compliance with CDC guidelines for head and spinal cord injury surveillance, we have not used it for state assessment purposes or for state/national comparisons.

Geographic Variation

In 1994, 60% of Washington's head and spinal cord injuries occurred to residents of five counties: King (1,017), Spokane (406), Pierce (353), Snohomish (317) and Yakima (223).

Head and Spinal Cord Injuries, 1992-1994

Deaths and Non-Fatal Hospitalizations Per 100,000 Persons



Rates

35 .0 to 62 .9
63 .0 to 72 .6
72 .7 to 109 .9
110 .0 to 153 .9

State Average: 72.7
National Rate: NA

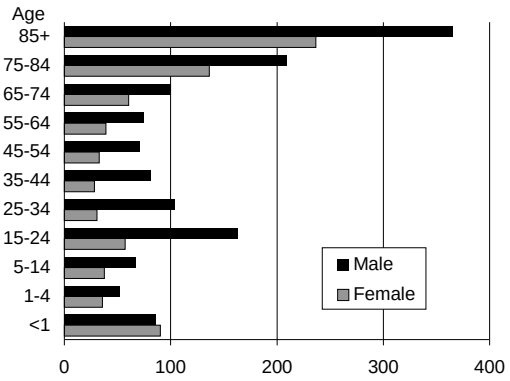
Examination of head and spinal cord injuries *rates*, however, produces a different picture. During 1992-1994, the counties with the highest age-adjusted head and spinal cord injury rates were: Adams, Stevens, Pend Oreille, Okanogan, Ferry, San Juan, Mason, Grays Harbor, Garfield, Jefferson, and Grant. With the exception of Adams County, the counties with the highest head and spinal cord injury rates also have the highest motor vehicle death rates.

The counties with the lowest head and spinal cord injury rates were Clark, Skamania, Asotin, Pacific, Cowlitz, Island, Pierce, and Kittitas. It is important to note that reported rates for head and spinal cord injuries include deaths and nonfatal injuries treated at hospitals in Washington. *Reported* rates may be substantially lower than *true* rates for southwest Washington counties because residents of these areas often receive medical treatment at hospitals in Oregon.

Age and Gender

In 1994, the age-adjusted head and spinal cord injury rate for males was 97.9 per 100,000, compared to a rate of 42.4 per 100,000 for females. Males are at higher risk for head and spinal cord injury at any age over one year. At highest risk are males 15-24 years of age and those 75 and older.

Head and Spinal Cord Injuries
by Age and Gender
Age-Specific Deaths and Non-fatal Hospitalizations per 100,000, Wash. State, 1994

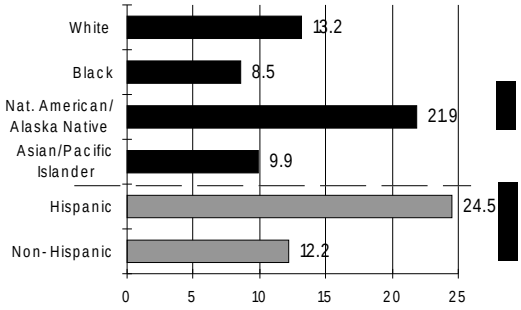


Race and Ethnicity

Race and ethnicity information is available only for fatal head and spinal cord injuries; it is not collected in hospital discharge records. Washington's population is predominantly white, so, as expected, most victims of head and spinal cord injuries in our state are white. In 1994, there were 740 fatal head and spinal cord injuries. Whites accounted for 677 (91%) of these deaths.

Although the number of non-white head and spinal cord injury deaths is small, rates for certain groups are very high relative to their population size. In 1994, the death rate for head and spinal cord injuries among whites was 13.2 per 100,000. By comparison, the rates for Hispanics during this same period was 24.5 per 100,000, and for Native Americans the rate was 21.9 per 100,000. Most of these deaths are attributable to motor vehicle crashes, which show a similar distribution by race/ethnic group. The underlying causes for these differences cannot be determined with available data.

Head and Spinal Cord Injuries
by Race and Ethnicity
Age-Adjusted Deaths per 100,000, Wash. State, 1994



Other Measures of Impact and Burden

Head vs. spinal cord injuries. The ratio of head injuries to spinal cord injuries is about 14 to 1. Considering injuries severe enough to require hospitalization, the case fatality rate for spinal cord injuries is slightly lower than the rate for head injuries; however, nonfatal spinal cord injuries tend to be more serious as measured by average length of hospital stay, multiple hospitalizations, and long term care requirements.[2]

Deaths. About one in five head and spinal cord injuries is fatal. In 1994, 740 head and spinal cord injuries resulted in death.

Hospitalizations. Nonfatal hospitalized head and spinal cord injuries outnumber fatalities by a ratio of nearly 5:1. In 1994 there were 3,117 hospitalizations for treatment of head and spinal cord injuries. The average (mean) length of hospital stay for a head injury is eight days; the

average length of stay for a spinal cord injury is 19 days.[2]

Long-term disability. Head and spinal cord injury victims are at high risk for continuing disability. Approximately 15% of hospitalized head injury victims and 47% of spinal cord injury victims are transferred to other facilities for additional or long-term rehabilitative care.[2]

Risk and Protective Factors

In 1994, the primary agents or mechanisms of head and spinal cord injury in the general population were:

- Motor vehicles - collisions injuring the driver or passenger (n=1,232),
- Falls and jumps (n=1,072),
- Blunt objects (n=261),
- Pedestrian-related injuries (n=229),
- Assault by hands, feet, fists (n=132),
- Motorcycles (n=130).

The mechanisms and circumstances associated with head and spinal cord injuries vary according to the victim's age and gender.

About 90% of head and spinal cord injuries are unintentional. In 1994, 3,361 of such injuries were unintentional, and 377 were the result of self-directed or interpersonal violence.

Risk factors. The risk of sustaining a head injury is increased by failure to use seat belts, child car seats, bicycle helmets, other protective sports helmets and equipment, and motorcycle helmets. There is a four-fold increase in the risk of head injuries in unhelmeted motorcyclists.

The use of alcohol is a major risk factor when driving, bicycling, being a pedestrian, or participating in any activity where a fall might occur.

Head injury to horseback riders is higher than for most other sports.

Protective factors. Use of seat belts can be effective in preventing head injuries in motor vehicle crashes. The belted car occupant is six times less likely to sustain a disabling injury than the occupant who is not restrained.

Measures to prevent falls in the elderly will help protect this age group from head and spinal cord injuries. See section on "Hip fractures among people 65 and older."

Use of helmets when riding bicycles, motorcycles and horses is a protective factor. Bicycle helmets reduce the risk of serious head injury by 85%.[3] Passage of the motorcycle helmet law in 1990 has been associated with a substantial decrease in motorcycle fatalities and serious injuries.[1]

Playground and sports-related head and spinal cord injuries are often preventable through a combination of behavioral and environmental/structural interventions.

High Risk Groups

The elderly. The elderly, both males and females who are 75+ years of age have the highest risk for head injury (related to falls).

Young men. The second highest risk group is males between ages 15-24 years (related to motor vehicle occupant injuries). Overall, males have over twice as many head injuries as females. The two groups at highest risk for spinal cord injury are males 15-24 years (mainly motor vehicle crashes) and men 75 and older (mainly falls).

Children. Although not at as high a risk as the elderly and 15-24 year old males, young children under age 5 are at risk for head injury due to falls. Among the 5-14 age group, bicycling is the leading cause of head injuries.[2]

Intervention Points, Strategies and Effectiveness

It is widely recognized that education and legislation are effective in increasing helmet and seat belt use, and that these behaviors are effective in reducing the incidence of head and spinal cord injuries. To assure continued progress in reducing head and spinal cord injuries, emphasis should be given to the following strategies:

- Maintain current Washington state seat belt and motorcycle helmet legislation and support enforcement of the laws.
- Support community bicycle helmet promotion projects. The use of bicycle helmets can reduce the risk of serious head injury in a bike crash by 85%.
- Support public education campaigns to increase awareness and promote greater seat belt use, especially among teenagers.

Recognizing that many head and spinal cord injuries cannot be prevented by helmets or seat belts, emphasis should also be given to strategies which target specific high risk groups, as follows:

- Implement strategies for prevention of falls among the elderly (see section on hip fractures for specific intervention points).
- Supervise school playgrounds effectively; assure adequate resilient surfacing underneath play equipment and adequate spacing between adjacent pieces of equipment.

Data Sources

State head and spinal cord injury death data: Washington Department of Health, Center for Health Statistics. Prepared by DOH Injury Prevention Program.

State nonfatal head and spinal cord injury hospitalization data: Washington Department of Health, Hospital and Patient Data. Prepared by DOH Injury Prevention Program.

For More Information

Department of Health Injury Prevention Program Telephone: (360) 586-5693.

Technical Notes

Most state-specific year 2000 goals in this document were established in the 1994 Washington State Public Health Improvement Plan (PHIP) through a process that included broad participation by interested parties. The head and spinal cord injury goal was set later by Department of Health staff.

Age adjustment: See technical appendix

Race and ethnicity: See technical appendix

Endnotes:

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[1] Traffic collisions in Washington State. Annual Reports 1990 through 1995. Washington Traffic Safety Commission.

[2] Head and Spinal Cord Injuries in Washington State, Department of Health, Injury Prevention Program. April, 1994.

[3] Thompson RS, RiVara FP, Thompson DC. A case-control study of the effectiveness of bicycle safety helmets. N Engl J Med. 1989. 320: 1361-1367.